

Novel Self-Cleaning Surfaces for Biofouling Prevention, Phase I

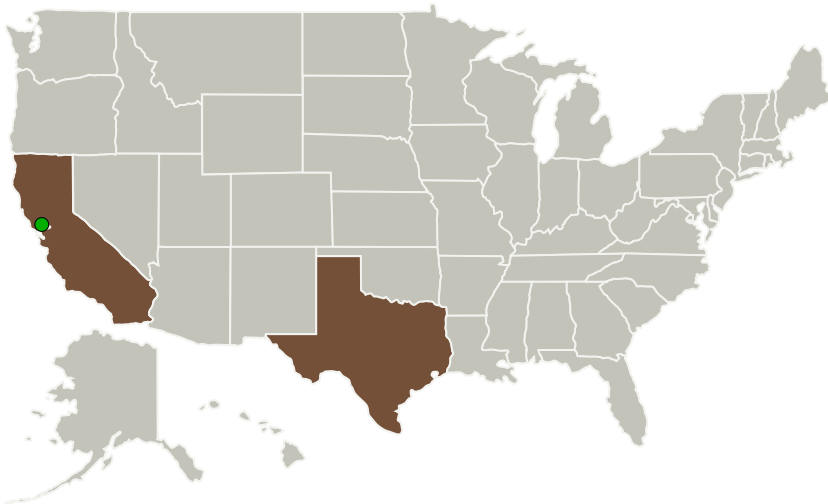
Completed Technology Project (2010 - 2010)



Project Introduction

One of the most problematic issues that facing efficient water reclamation processes for long duration space missions is biofilm growth and biofouling on RO membrane and transfer line surfaces. An immediate need therefore exists to develop new technologies to solve the problems associated with biofouling of water recovery subsystem surfaces. Lynntech, Inc. proposes a novel technology for the preparation and demonstration of stimuli-responsive, reagent-free, self-cleaning surfaces. This technology is based on an innovative yet simple and inexpensive approach to functionalize base membrane and water line surfaces with novel coatings. These coatings respond to the application of a physical stimulus such as a change in temperature by changing their physical attributes such as their physical dimensions. The change in their physical dimensions in turn triggers lifting off of adherent biofilms thereby regenerating the surface and reverting to optimal operational efficiency parameters such as optimized operational RO pressures as well as optimal transfer line flow rates. Phase I work will concentrate on providing proof-of-concept for the self-cleaning surface technology, while Phase II will involve the fabrication and delivery of prototype self-cleaning RO membranes and water transfer line components to NASA-JSC for integration and testing within its integrated advanced water recovery test system.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Lynntech, Inc.	Lead Organization	Industry	College Station, Texas
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

**January 2010:** Project Start**July 2010:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/139299>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Lynntech, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

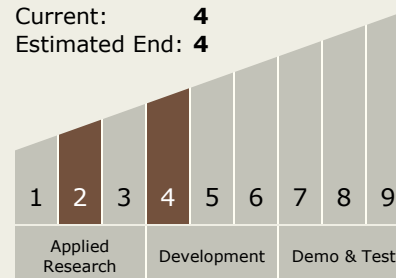
Anjal C Sharma

Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.5 Coatings

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System